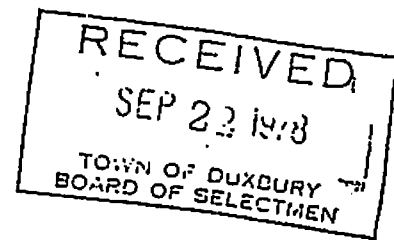


CLAMMING



SOFT SHELL CLAM
SURVEY FOR THE
TOWN OF DUXBURY

by
Patricia Rule
Assistant Marine Fisheries Biologist

September 19, 1978
Massachusetts Division of Marine Fisheries
100 Cambridge Street
Boston, Massachusetts 02202

A survey of the soft shell clam population in Duxbury was conducted by the Division of Marine Fisheries in July and August, 1978. The object of the survey was to determine the percentage of legal and sublegal clams in each population, and to estimate the standing crop of legal clams in these areas. This study would determine if the town was justified in a soft shell closure for 1978, and would provide information to recommend a projected length of closure for these areas.

Duxbury's entire shoreline was covered by this survey. Notations were made for each area on substrate, predators, and other types of shellfish. The soft-shell population was determined by looking for concentrations of holes, estimating the area of each population, and taking square foot samples within this area. Random digging for shellfish was done to get larger quantities of shellfish to measure for size-ratio information.

Figure 1 is a map showing the productive shellfish flats found. In all areas, populations were patchy and inconsistent, and no areas appear large enough to support more than a modest recreational fishery. Much of the substrate in Duxbury is loose sediment and deep mud, which is not suitable as habitat for soft shell clams. Most of the population is located at one quarter tide up to high tide with the lower intertidal areas supporting populations of razor clams, mud snails, and varieties of worms. These muddy areas probably represent greater than eighty percent of Duxbury's tidal flat acreage.

There are flats in Duxbury which are potentially good soft shell areas which are devoid of clams. Figure 2 shows two major flats that were found productive in a 1971 survey and found non-productive in the 1978 survey. This

is probably due to over digging, and mortality of seed due to predators. Duxbury is heavily infested with horseshoe crabs which take a large toll of soft shell seed. Green crabs and moonsnails probably also contribute to the predation problem although they were not as evident in the survey as were the horseshoe crabs.

Table 1 shows the percentage of legal vs. sublegal clams in each population; the percentage of the sublegal population that is one and three quarter inches, and the percentage that is one and one-half inches in length. Table 2 shows the size of the area, the number of clams per square foot and an estimate of the bushels of legal clams in each area. From standard rates of growth, one and three quarter inch clams should be harvestable by June, 1979, and one and one-half inch clams would be legal size by August 1979. Areas should have at least 50% legal population and more appropriately 70% legal population or better before they are dug. Area L is 86% legal stock and 50% of the remaining sublegal stock should be 2" by June of 1979. This however is a very small area, and appears to be what was left from a flat that has been overdug. Areas B, C, D, I, O, and P, are more closely divided, and in these areas a large percentage of the sublegal stock would be legal by August of 1979. Area E, G, and H would also have a large percentage of legal stock by that time.

Our recommendation is that at the very minimum, all areas in Duxbury should remain closed until fall of 1979. None of the legal percentage of population in any of the areas are high enough to warrant opening areas any sooner. Opening in the fall would also eliminate the heavy digging pressure found in the summer. Rotation among these areas is also advisable. Grouping these areas physically together to facilitate posting and enforcement, we feel that Areas

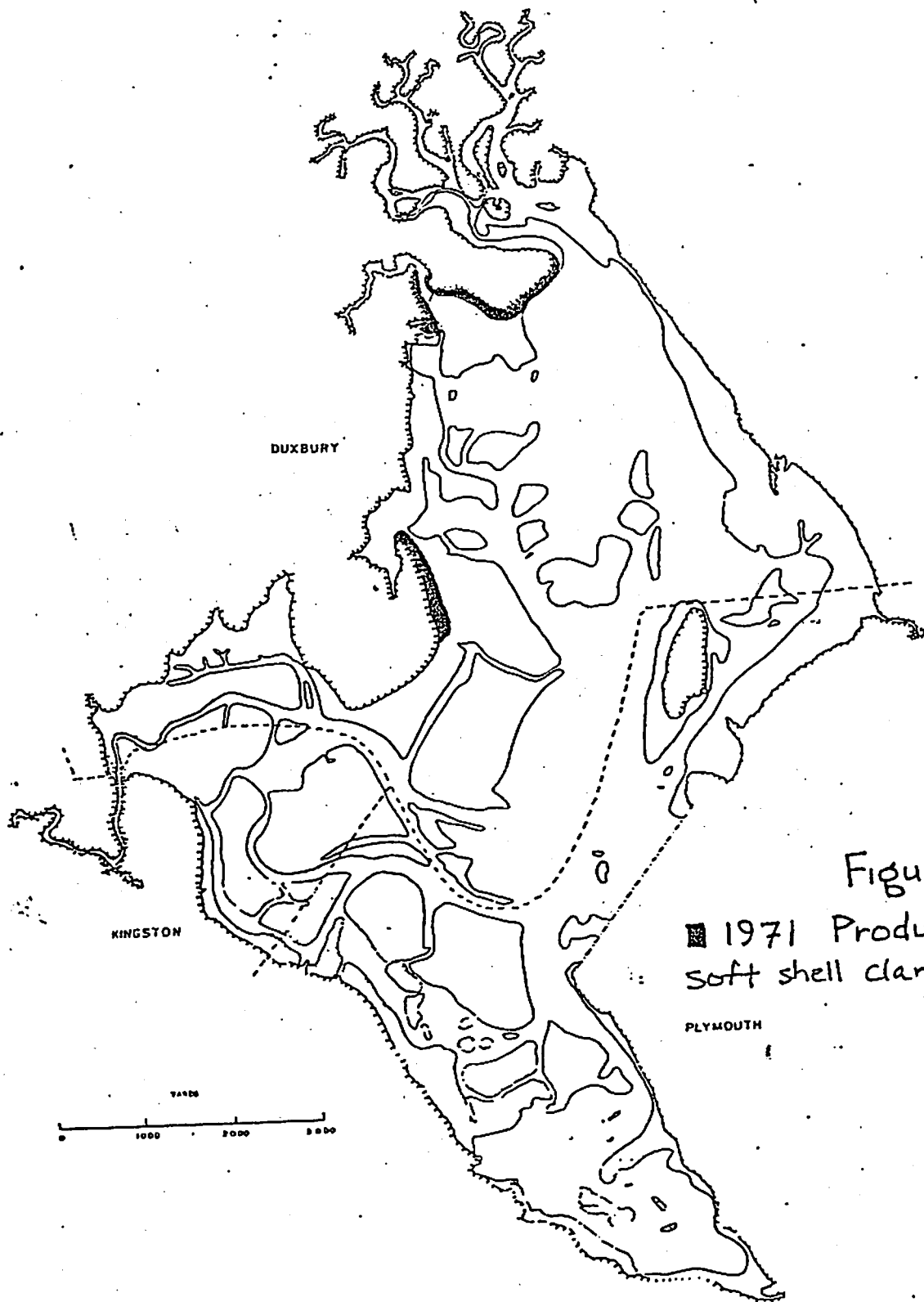
47

B, C, D, and E; areas G, H, and I, and areas O and P, could be considered similar enough in population percentages for rotation purposes." For example, O, P, and G, H, and I, could be opened in the fall, and then closed, then area B, C, D, and E, opened in the spring. We also recommend avoiding the summer digging season in 1980.

A recommendation which we feel is more acceptable and which we would like to see implemented is to keep Duxbury closed until fall of 1980, and then open on a rotational basis. We feel that Duxbury is overfished and would be much more productive if allowed another season for a new set and growth. A program could be begun in the meantime to alleviate some of the predator problem, otherwise the seed which should grow to legal size would suffer a greater mortality. In addition to this, diggers should take the time to replant seed into the sand with siphons up as they harvest an area in order to cut down on losses due to digger mortality which varies from 50-90%.

The shoreline near area F should remain untouched at least until 1981, at which time the area should be rechecked before opening. Area L should be left for spawning to populate Standish Shore, and additional seeding by hand in this area should be done to hasten repopulation in this area.

One final comment is to recommend that it could be beneficial to fishermen in the area if more advantage is taken of the large population of razor clams in Duxbury, and their utilization promoted.



6/7

TABLE 1

Area	of sublegal			
	% legal	% sublegal	% 1 3/4"	% 1 1/2"
A	28	72	7	31
B	45	55	24	12
C	48	52	9	36
D	52	48	50	25
E	27	73	16	37
F	29	71	0	0
G	31	69	45	30
H	30	70	43	43
I	53	47	39	33
J	10	90	0	40
K	6	94	14	14
L	86	14	50	0
M	8	92	14	41
N	0	100	13	37
O	43	57	63	32
P	35	65	22	45

7/7

TABLE 2

	Acres	No. clams/ Sq. Ft.	Legal stock Bushels	Projected Bushels when legal	
				1 3/4"	1 1/2"
A	20	3	361	280	160
B	20	4	774	280	160
C	2.5	7	180	35	50
D	10	5	559	360	100
E	15	3.3	287	210	150
F	12.5	1.2	18.7	0	0
G	15	9.3	930	840	360
H	0.5	10	32	18	30
I	5	5	285	130	60
J	4	1.6	14	---	12.8
K	5	22.6	1459	230	140
L	0.5	3.5	33	12	0
M	5	23	1980	230	380
N	0.5	31.5	0	28	50
O	5	2.9	134	120	40
P	5	15	564	230	280